



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/916,472	07/30/2001	Hiroaki Hoshi	35.C15638	8751

5514 7590 03/28/2003

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

LUU, THANH X

ART UNIT

PAPER NUMBER

2878

DATE MAILED: 03/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/916,472

Applicant(s)

HOSHI ET AL.

Examiner

Thanh X Luu

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 23 January 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

This Office Action is in response to amendments and remarks filed January 23, 2003. Claims 1-12 are currently pending.

Drawings

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on January 23, 2003 have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-12 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1-12, it is unclear in its given context how reference light and image light are "unrelated", yet a predetermined frequency difference between the reference light and image light is known. That is, the predetermined frequency difference relates the reference light to the image light. Thus, contrary to the claim, it appears that the reference light and the image light are related. For examination purposes, Examiner has understood the claim language to mean that the reference light and image light are generated by different light sources.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-4, as understood, are rejected under 35 U.S.C. 102(b) as being anticipated by either one of Brosnan et al. (U.S. Patent 5,610,705) or Meyzonnetie et al. (U.S. Patent 5,485,009).

Regarding claims 1-4, Brosnan et al. disclose (see Figure 1) an image pickup apparatus, comprising: an image pickup unit having an array of a plurality of photodetection elements (24); a light-emitting element unit (26) for emitting reference light (32) having a predetermined frequency difference with respect to a frequency of light comprising an optical image (16) of an object, wherein the reference light and the image light are not generated by a same light source; and a wave synthesizer (20) for synthesizing the incident light and the reference light from the light-emitting unit and guiding the synthesized light to the image pickup unit. Brosnan et al. further disclose (see column 5, lines 5-8) the device could be reconfigured as a homodyne configuration in which the frequency difference (offset) is zero or constant (see column 5, lines 58-61). The predetermined frequency difference is modulated according to a predetermined rule (heterodyning).

Meyzonnetie et al. disclose (see Figure 7) an image pickup apparatus, comprising: an image pickup unit having an array of a plurality of photodetection

Art Unit: 2878

elements (D1-D4); a light-emitting element unit (25) for emitting reference light having a predetermined frequency difference with respect to a frequency of light comprising an optical image of an object, wherein the reference light and the image light are not generated by a same light source; and a wave synthesizer (27) for synthesizing the incident light and the reference light from the light-emitting unit and guiding the synthesized light to the image pickup unit. Meyzonnetie et al. further disclose (see column 5, lines 52-53) frequency of the reference light is locked to the transmission frequency; thus, the frequency difference is zero or constant. The predetermined frequency difference is modulated according to a predetermined rule (heterodyning).

6. Claims 1, 4, 5, 7, 11 and 12, as understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Pace et al. (U.S. Patent 3,746,454).

Regarding claims 1, 4, 5, 7, 11 and 12, Pace et al. disclose (see Figure 1) an image pickup apparatus, comprising: an image pickup unit having an array of a plurality of photodetection elements (12-14); a light-emitting element unit (7) for emitting reference light having a predetermined frequency difference with respect to a frequency of light comprising (16) an optical image (3) of an object, wherein the reference light and the image light are not generated by a same light source; and a wave synthesizer (8) for synthesizing the incident light and the reference light from the light-emitting unit and guiding the synthesized light to the image pickup unit. Pace et al. further disclose (see Figure 1) a microlens array (9-11) provided for each of the photodetection elements. Pace et al. also disclose (see Figure 1) an optical system (25) for focusing light on the image pickup unit and a signal processing circuit (18) for processing an output signal

from the image pickup unit. Pace et al. also disclose (see Figure 1) the light-emitting element unit (7) is provided in common to each of the photodetection elements. That is, light from the light-emitting element unit reaches all of the photodetection elements. In addition, Pace et al. disclose (see Figure 2) the apparatus includes a plurality of more than two of the image pickup units for used in obtaining a combined image. The predetermined frequency difference is modulated according to a predetermined rule (heterodyning).

7. Claims 1, 4 and 6, as understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Horiuchi et al. (U.S. Patent 5,463,461).

Regarding claims 1, 4 and 6, Horiuchi et al. disclose (see Figure 1) an image pickup apparatus, comprising: an image pickup unit having an array of a plurality of photodetection elements (3, 4); a light-emitting element unit (1) for emitting reference light (L_0) having a predetermined frequency difference with respect to a frequency of light comprising an optical image (S) of an object, wherein the reference light and the image light are not generated by a same light source; and a wave synthesizer (2) for synthesizing the incident light and the reference light from the light-emitting unit and guiding the synthesized light to the image pickup unit. Horiuchi et al. further disclose (see column 1, line 16-17) the light-emitting unit includes a semiconductor laser. The predetermined frequency difference is modulated according to a predetermined rule (heterodyning).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1 and 8, as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner et al. (U.S. Patent 5,450,223) in view of Meyzonnetie et al.

Regarding claims 1 and 8, Wagner et al. disclose (see Figure 6) an image pickup apparatus, comprising: an image pickup unit having an array of a plurality of photodetection elements (428a-n); a light-emitting element unit (416) for emitting reference light (436) having a predetermined frequency difference (heterodyne mixing) with respect to a frequency of light incident (420a-n) on the image pickup unit; and a wave synthesizer (610a-n, 612a-n, 614a-n) for synthesizing the incident light and the reference light from the light-emitting unit and guiding the synthesized light to the image pickup unit. Wagner et al. further disclose (see Figure 6) the wave synthesizer comprises a light waveguide (614a-n) provided for each of the photodetection elements. Wagner et al. do not specifically disclose the image light and the reference light being generated from different light sources. Meyzonnetie et al. teach (see column 5, lines 50-55) that image light and reference light may be generated from the same light source or separate light sources. Meyzonnetie et al. recognize that choosing between the alternative configurations is a simple matter of design choice. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to

provide separate image light and reference light in the apparatus of Wagner et al. in view of Meyzonnetie et al. to provide separate transmission and reception modules, as desired, to better accommodate the other elements of the apparatus.

10. Claims 1 and 9-11, as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyagawa et al. (U.S. Patent 5,555,087) in view of Meyzonnetie et al.

Regarding claims 1 and 9-11, Miyagawa et al. disclose (see Figure 1) an image pickup apparatus, comprising: an image pickup unit having an array of a plurality of photodetection elements (30); a light-emitting element unit (20, 21, 22, 37, 32) for emitting reference light (S2) having a predetermined frequency difference with respect to a frequency of light incident (a5/a6) on the image pickup unit; and a wave synthesizer (42) for synthesizing the incident light and the reference light from the light-emitting unit and guiding the synthesized light to the image pickup unit. Miyagawa et al. further disclose (see Figure 1) an electric filter (34) adapted to extract a desired frequency band from outputs from the photodetection elements and controlling the frequency (with 32) of the reference light (s1) by using an output from the electric filter. Miyagawa et al. also disclose (see Figure 1) an optical system (44) for focusing light on the image pickup unit and a signal processing circuit (31) for processing an output signal from the image pickup unit. Miyagawa et al. do not specifically disclose the image light and the reference light being generated from different light sources. Meyzonnetie et al. teach (see column 5, lines 50-55) that image light and reference light may be generated from the same light source or separate light sources. Meyzonnetie et al. recognize that choosing between the alternative configurations is a matter of design choice. Thus, it

Art Unit: 2878

would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide separate image light and reference light in the apparatus of Miyagawa et al. in view of Meyzonnetie et al. to provide separate transmission and reception modules, as desired, to better accommodate the other elements of the apparatus.

Response to Arguments

11. Applicant's arguments filed January 23, 2003 have been fully considered but they are not persuasive.

Regarding claims 1, 7 and 11, Applicant asserts that Pace et al. do not disclose an "unrelated" reference light and an image light. Regardless of what the specification describes, Figure 1 of Pace et al. shows a separate laser (1) for generating the image light and a local oscillator laser (7) for generating the reference light. As understood by the Examiner, the disclosure from Figure 1 anticipates what Examiner believes Applicant intended to claim. That is, the image light and reference light is not generated by the same light source.

Applicant's other arguments are moot in view of the new grounds of rejection.

Thus, as set forth above, this rejection is proper.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X. Luu whose telephone number is (703) 305-0539. The examiner can normally be reached on Monday-Friday from 6:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta, can be reached on (703) 308-4852. The fax phone number for the organization where the application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

txl
March 19, 2003


Que T. Le
Primary Examiner